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PLANNING, ANALYZING AND DESIGNING OF MARRIAGE HALL BUILDING BY USING STAAD PRO

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ABSTRACT

Planning and designing of marriage hall building as our research work consists of planning, analyzing and preparation of essential drawing . for this study journals and books were referred for planning of marriage hall building to get an idea to prepare about Marriage Hall building .Visited some marriage hall building which ae under the construction and came to know the methods of recent development in construction and the arrangement of room and planning the structural arrangement of room . The building consists of ground floor, first floor (g+1) . All the design ,analysis and drawing as per IS code.

1. INTRODUCTION

National marriage hall association, the term marriage hall was generally used in the India. Clinton children , one of the organizers, described it as in the India many villages and towns have their own marriage centre ,although nearby schools may offer their assembly or dinning hall after school for marriage centre activities. For example , local schools nears out on may host dance , or sporting activities provided by a local marriage centre. Marriage hall are public location where members of a marriage tend to gather for group activities, social support, public information , and other purposes. They may sometimes be open for the whole marriage or for a specialized group within the gather marriage . Despite concerns expressed by politicians and public officials that might provide a focus for alternative political and social activity , the idea was successful.

2. OBJECTIVES

2.1 Planning: Draw G+1 Marriage Hall by using AUTOCAD.

2.2 Analzing: Analyze G+1 Marriage Hall by using STAADPRO. In which ground floor include stage, groom and bridal room, seating area for guests. And first floor include kitchen, dinning, wc .

2.3 Designing: Designing of marriage hall is also done by using STAADPRO like design of beam , column , slab.

3. SPECIFICATIONS

3.1 Foundation

Earth work excavation for foundation for all column footings will be excavated and will be n cement concrete 1:1:2m, 1100mm wide and 300mm thick laid at 1500mm below ground level, The masonry footing will be in brickwork in cement mortar 1:6. The footing sie is 1000x1500mm. The foundation concrete for framed structure, all main wall and footing of cement concrete of 1:1:2 mix, will be provided, and also footing consist of Random Rubble Masonry will be provided.

3.2 Basement

The basement will be in 1st class brick work in cement mortar 1:5, and 450 mm thick above ground level for all walls.

The basement will be filled with clean sand to a depth of 300 mm. A damp proof course in cement mortar 1:3, 20 thick will be provided for all walls at basement level. The basement will be constructed by using Random Rubble masonry with cement mortar 1:5.

3.3 Sand Filling In Basement

1100mm wide and 300 mm thick laid at 1500 mm below ground level. The masonry footings will be in brickwork in cement mortar 1:6. The footing size is 1000x1500 mm. The foundation concrete for framed structure , all main wall and footing of cement concrete of 1:1:2 mix, will be provided , and also footing consist of Random Rubble Masonry will be provided.

The basement filled up with clean sand to a depth of 50mm and it should be compacted with water as per standard specifications.

3.4 Damp Proof Course

A Damp proof course using cement mortar 1:3 of 150mm thick will be Provide for all main walls at basement level

3.5 Flooring Concrete

The flooring concrete of 1:1:2 mix with suitable thick will be provided should be finished above the sand filling and it by mosaic tiles.

3.6 Super Structure

All the walls will be in I class brick work in cement mortar 1:5, using first class bricks, and 230 mm thick. The partition walls will be 100 mm thick in brick work in cement mortar 1:5, using first class brick. The height of all walls will be 3000 mm above floor level. All the walls including basement will be plastered

smooth with cement mortar 1:4 externally and 1:6 internally for 12.5 thick. Parapet walls 230 mm thick and 1m high will be provided all around.

3.7 Roofing

The roofing will be of R.C.C 1:1:2 mix, 150 mm thick flat slabs over all the rooms. A weathering course in brick jelly lime concrete plastered with combination mortar 1:1:2mix, 75 mm thick will be provided over the slab.

3.8 Lintel

All internal wall openings will be provided with R.C.C lintel 1:1:2mix, 120 mm thick and all external walls openings will be provided with lintel cum sunshade 1:1:2 mix, 120 mm thick and sunshade will be 600 mm wide.

3.9 Sunshade

600mm wide projections with 150mm thick at fixed end and 75mm thick at free end will be provided for all external opening using R.C.C 1:1:2 mix.

3.10 Plastering For Super Structure

All walls will be plastered smooth surface with cement Mortar 1:5, 12 mm thick.

3.11 Sound Proofing For Ceiling & Wall

In ceiling of all rooms and walls are soundproofed with latest type soundproofing material.

3.12 Weathering Course

A Weathering course using brick jelly concrete will be provided average 75 mm thick over the slab and finished with two course of hydraulic pressed Mangalore flat tiles using cement mortar 1:5 mixed with 10% of crude Oil.

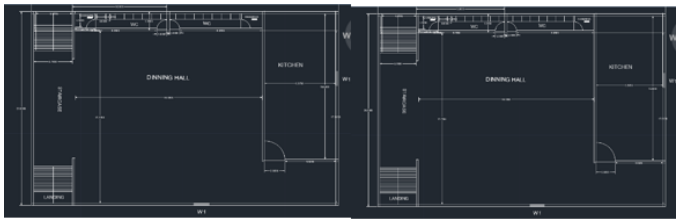
3.13 Size Of All Doors, Windows And Ventilators

D1 - DOOR = 1000 x 2100 mm
D2 - DOOR = 900 x 2100 mm
D3 - DOOR = 800 x 2100 mm
W1 - WINDOWS = 1200 x 1200 mm
V1 - VENTILATOR = 500 x 300 mm

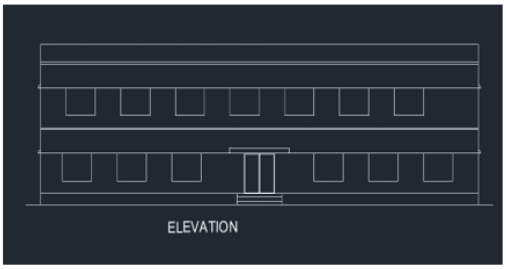
3.14 White Washing

One primer coat and two coats of color wash to be done for all plastered wall surface.
3.15 Steps
The step will be in brick work in cement mortar 1:5
Rise =150mm,
Tread = 300mm.
3.16 Diamensions of structural element
Stage :- 7m*9.4m
Groom/Bridal Room :- 5m*5m
Staircase : - 4m*5m
Reception hall :- 20.1m*20.32m
Dinning hall :- 15.04m*20.32m
Kitchen :- 10.46m* 14.63m
Wc / bath :- 1.2m* 2.1m

4. PLANNING



GROUND FLOOR FIRST FLOOR



ELEVATION

5 ANALYZING RESULT IN STAAD PRO

5.1 whole structure view

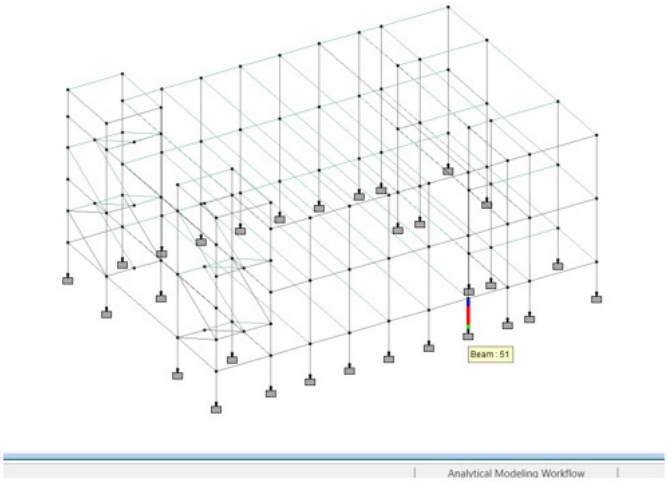


Figure: Whole Structure View

5.2 3D Rendering view

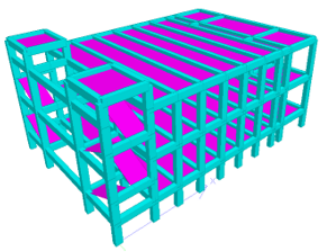


Figure : 3d Rendering View 1

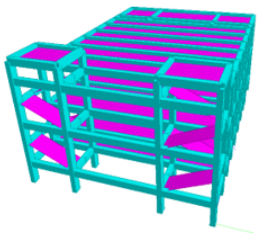


Figure : 3d Rendering View 2

5.3 Loading diagram

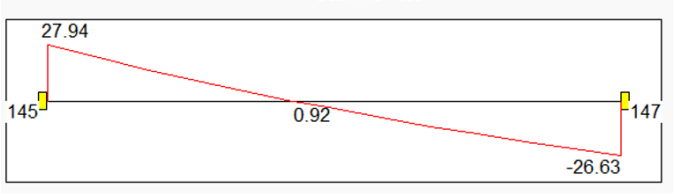


Fig 01 Shear force diagram

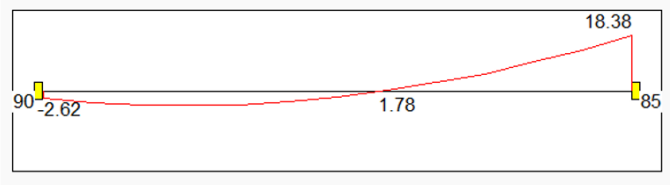
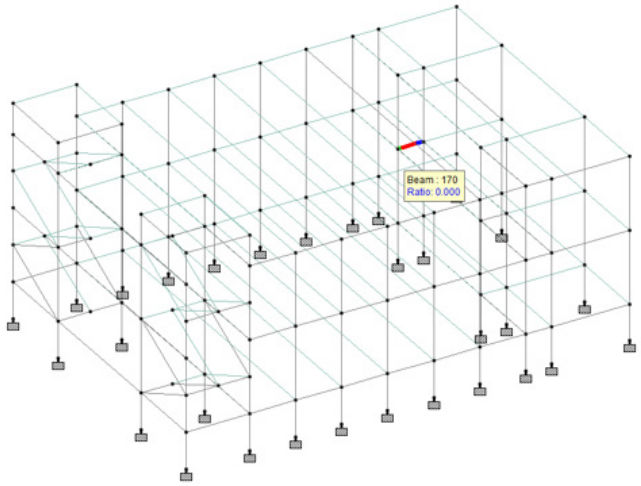
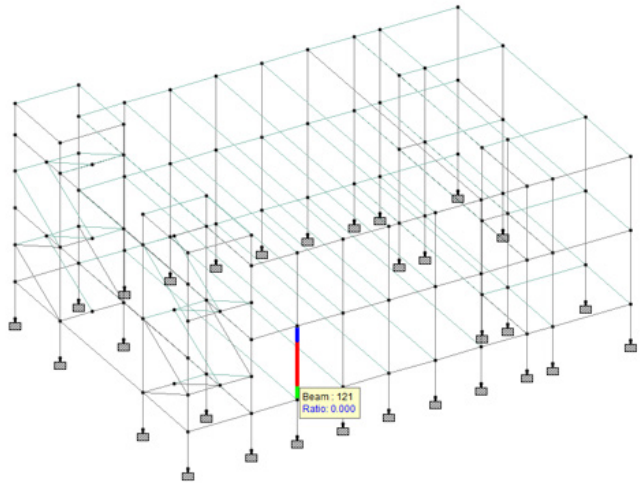


Fig 02 bending moment daigram

5.4 show the maximum bending moment at critical beam.



5.5 show the maximum bending moment at critical column.



6. DESIGN

6.1 Beam

Beam size = 650x1200mm
Wall thickness = 230mm
Total load = 150 KN
Factored load = 300KNm
Effective span = 20.3m
Approximate area of steel = 603mm2
Provide 2 legged 8mm ø stirrup at a spacing of 300mm
Provide 2 legged 8mm ø stirrps at the spacing of 180mm near the support.
Moment of resistance = 487.53x10^6N/mm
Hence ok

Result:

Size of the beam = 650mmx1200mm
Area of the steel = 603mm2
Spacing of the beam = 180mm

6.2 Column

Size of column = 750x1200mm
Effective length = 3250mm
Slenderness ratio1 = 2.70<12
Slenderness ratio2 = 4.33<12
%of steel=1.72%
Factored load = 3000KN
Strength of the column = 39998.64mm

Result:

Area of steel = 900000mm2
Strength of column = 1332.55KN

6.3 Slab

Side ratio =30/20=1.5<2
It has designed as two way slab.
Effective depth = 333.33mm
Over all depth = 300+20=320
Load calculation
Self weight of slab = 8KN/m
Effective span = 20.3mm

Result:

Final design over all depth = 170mm
To provide 25mm dia of bar @100mmc/c
To provide 12mm dia od bar @300mmc/c

6.3 Footing

Area of footing =550000mm2
Side of square footing = 2.54m
Net upward design pressure = 302.25KNm
Depth of footing required = 262.07mm
Total thickness = 570mm
Actual bearing stress on the load area = 130000
Chech for safe bearing=104.83KNn
Total load on soil = 243.73<300

Result:

Size of footing = 2.54mx2.54m
Over all depth = 570mm
Clear cover = 50mm
Effective depth =520mm
Provide 25mm dia @ of bar @150c/c each direction.

7. OBSERVATION AND CONCLUSION

It is concluded that application of software in civil industry plays important role in our study. In our Marriage hall building project, adopted limit state method for analysis and design of our structure. By using the application software analyze and observed the whole project.the project is completed with less time and high accuracy by using application of the software.After analyze and design of marriage hall by using applicaton software check manually.We are observed that by using application software the results are more accurate than manually and more accurate.so,we can conclude that by using application software we can easily analyze and design of any structure.

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